

IN THE CLAIMS

1 1. [original] An apparatus comprising:
2 an IP wrapper circuit;
3 a packet switch;
4 one or more cherrypicker multiplexers; and
5 a local area network coupling said IP wrapper to said packet switch and
6 coupling said packet switch to said one or more cherrypicker multiplexers.

1 2. [currently amended] The apparatus of claim 1 wherein said cherrypicker
2 multiplexers and said packet switch cooperate to receive data indicating video programs to
3 be transmitted downstream to customers over DSL lines, cable television hybrid fiber coaxial
4 cable networks or satellite downlinks and to receive MPEG data encapsulated in IP packets
5 which are encapsulated in local area network packets from said IP wrapper circuit and to pick
6 out only the MPEG packets containing data encoding the video programs which are to be
7 transmitted and assemble said MPEG packets into MPEG transport streams, and wherein
8 said cherrypicker multiplexers further comprise circuitry to adjust the bandwidth of the MPEG
9 transport streams so generated to match the available bandwidth to transport or and/or
10 process the data of said video program(s).

11
1 3. [currently amended] An apparatus comprising:
2 one or more video servers that output MPEG transport streams;
3 one or more satellite feeds that output MPEG transport streams;
4 an IP wrapper circuit coupled to said one or more video servers and said one
5 or more satellite feeds;
6 a packet switch;
7 one or more cherrypicker multiplexers; and
8 a local area network coupling said IP wrapper circuit to said packet switch and

coupling said packet switch to said one or more cherrypicker multiplexers;
means for receiving upstream requests for video-on-demand programs and
sending data to said cherrypicker multiplexers which identify the requested programs;
and
means for sending data to said one or more video servers or and/or satellite
feeds or both said video servers or satellite feeds identifying which video program
data should be sent to said cherrypicker multiplexers through said IP wrapper circuit,
said local area network and said packet switch for assembly into MPEG transport
streams for transmission to customers which made said upstream requests.

4. [currently amended] An apparatus comprising:

one or more video servers that output MPEG transport streams;
one or more satellite feeds that output MPEG transport streams;
one or more web servers;
any one or more other types of servers on which applications programs may
be run remotely from customer sites;
an IP wrapper circuit coupled to said one or more video servers and said one
or more satellite feeds;
a packet switch coupled to said one or more web servers and said any one or
more other types of servers;
one or more cherrypicker multiplexers;
a local area network coupling said IP wrapper to said packet switch and
coupling said packet switch to said one or more cherrypicker multiplexers; and
upstream channel means for receiving upstream requests from customers for
video programs and requests or commands to obtain data from the internet via said
web server or execute application programs on said other servers, and for identifying
the requested video programs to the appropriate one or more of said video servers or

18 satellite feeds or both and to send said request for data and commands to one or
19 more the appropriate web server or any other types of server which can supply said
20 requested data or execute said command;

21 and wherein said IP wrapper circuit and said packet switch cooperate to
22 packetize said requested video program data appropriately and route said packetized
23 video data and other requested data output by said one or more web servers and
24 said any one or more other types of servers to the appropriate one or more means of
25 ~~said cherrypicker multiplexers~~ for transmission to the one or more customers who
26 requested said data.

5. [original] The apparatus of claim 4 wherein said cherrypicker multiplexers further
comprise means for adjusting the bandwidth of data to be sent to customers to lesser
bandwidths if necessary.

1 6. [currently amended] An apparatus comprising:

2 an IP wrapper circuit for receiving MPEG transport streams on one or more
3 inputs, each said MPEG transport stream comprised of a plurality of MPEG packets,
4 each MPEG packet having a program identification code (hereafter a PID) and
5 mapping said PIDs the program identification codes (hereafter PID) and input number
6 for each MPEG packet in each said transport stream into an IP packet header
7 multicast destination address and encapsulating one or more of said MPEG packets
8 having the same PID and input number into an IP packet and encapsulating each IP
9 packet into a LAN packet having an LAN packet destination address which is a
10 multicast address but which is unique to the PID and input number of the MPEG
11 packets enclosed therein;

12 a local area network coupled to said IP wrapper circuit;

13 a packet switch coupled to said IP wrapper circuit via said local area network;

one or more cherrypicker multiplexers coupled to said packet switch via said local area network, each functioning to receive data defining which programs have been requested by one or more customers or which is to be transmitted regardless of requests for it and generating and transmitting to said packet switch one or more packets identifying by LAN packet destination address the LAN packets said packet switch is to route to said cherrypicker multiplexer, and for receiving from said packet switch the requested LAN packets encapsulating MPEG data and assembling MPEG transport streams that are to be sent to said customers containing data encoding the programs which have been requested or which are to be transmitted regardless of request, and encapsulating MPEG packets from said transport streams into UDP/IP or TCP/IP packets.

7. [original] The apparatus of claim 6 further comprising an IP dewrapper circuit coupled to said cherrypicker multiplexers through said packet switch and said local area network and functioning to receive LAN packets encapsulating UDP/IP or TCP/IP packets which encapsulate at least MPEG packet data and which are addressed to said IP dewrapper circuit, said IP dewrapper circuit functioning to strip off the LAN packet header and UDP/IP or TCP/IP packet header and output a pure MPEG transport stream, and wherein said cherrypicker multiplexers function to encapsulate the UDP/IP or TCP/IP packets they generate in LAN packets addressed to said IP dewrapper circuit and transmit them over said local area network to said packet switch.

8. [currently amended] The apparatus of claim 6 further comprising dedicated data paths from each said cherrypicker multiplexer to one or more DSL modems or cable modems or satellite uplink facilities.

9. [currently amended] The apparatus of claim 6 further comprising a second local or

2 wide area network of a different type than the type of local area network coupled to said
3 packet switch, said second local or wide area network, ~~such as an ATM cell network~~, coupling
4 said cherrypicker multiplexers to one or more DSL modems or cable modems or satellite
5 uplink facilities.

6
1 10. [original] The apparatus of claim 6 further comprising means for receiving
2 upstream requests for video-on-demand programs or other TCP/IP packetized data from the
3 internet or other sources and for transmitting those requests to said cherrypicker multiplexers.

4
1 11. [original] The apparatus of claim 10 wherein said cherrypicker multiplexers
2 convert said requests to particular PIDs and input number, and generate and send to said
3 packet switch LAN packets identifying the particular LAN packets by LAN destination address
4 which will carry the data requested in the upstream request.

5
1 12. [original] The apparatus of claim 11 wherein said packet switch further functions
2 to receive said LAN packets identifying LAN packets to be routed to said cherrypicker
3 multiplexers and generates and sends messages to the appropriate source of the requested
4 data requesting that the requested data be sent to said packet switch.

1 13. The apparatus of claim 6 further comprising a web server coupled to the internet
2 and a local area network connection between said web server and said packet switch.

1 14. [currently amended] The apparatus of claim 6 further comprising a wide ~~are~~ area
2 network data path between said packet switch and one or more other cable system
3 headends or DSL central offices or satellite uplink facilities such that requested data may be
4 received from said one or more other cable system headends or DSL central offices or
5 satellite uplink facilities.

1 15. [currently amended] An apparatus comprising:

2 one or more video servers ~~and/or~~ or satellite uplink/downlink circuitry or both
3 that output MPEG transport streams encoding one or more video programs, each
4 MPEG transport stream comprised of a plurality of MPEG packets each having a
5 program identification code (hereafter PID);

6 an IP wrapper circuit for receiving MPEG transport streams on one or more
7 inputs coupled to said one or more video servers ~~and/or~~ or satellite receivers or both
8 said video servers and satellite receivers, and mapping said PIDs ~~the program~~
9 ~~identification codes (hereafter PID)~~ and input number for each MPEG packet in each
10 said transport stream into an IP packet header multicast destination address and
11 encapsulating one or more of said MPEG packets having the same PID and input
12 number into an IP packet and encapsulating each IP packet into a LAN packet
13 having an LAN packet destination address which is a multicast address but which is
14 unique to the PID and input number of the MPEG packets enclosed therein;

15 a local area network coupled to said IP wrapper circuit;

16 a packet switch coupled to said IP wrapper circuit via said local area network;

17 one or more cherrypicker multiplexers coupled to said packet switch via said
18 local area network, each functioning to receive data defining which programs have
19 been requested by one or more customers or which is to be transmitted regardless of
20 requests for it and generating and transmitting to said packet switch one or more
21 packets identifying by LAN packet destination address the LAN packets said packet
22 switch is to route to said cherrypicker multiplexer, and for receiving from said packet
23 switch the requested LAN packets encapsulating MPEG data and assembling MPEG
24 transport streams that are to be sent to said customers containing data encoding the
25 programs which have been requested or which are to be transmitted regardless of
26 request, and encapsulating MPEG packets from said transport streams into UDP/IP

27 or TCP/IP packets addressed either to ~~a the~~ host computer and a process on said
28 host computer at a customer site to which ~~said the~~ data is to be sent or addressed to
29 an IP dewrapper circuit coupled by said local area network to said packet switch and
30 which does not form part of the invention of this claim;

31 means for receiving upstream requests for video-on-demand programs or
32 other TCP/IP packetized data from the internet or other sources and for transmitting
33 those requests to said cherrypicker multiplexers;

34 and wherein said cherrypicker multiplexers convert said upstream requests to
35 particular PIDs and input numbers, and generate and send to said packet switch LAN
36 packets or other messages identifying the particular LAN packets to be routed to
37 each said cherrypicker multiplexer by LAN destination address, said LAN packet to be
38 routed to said cherrypicker multiplexers being ones which will carry the video
39 programs and other data requested in the upstream requests;

40 and wherein said packet switch functions to receive said LAN packets or
41 messages identifying the requested LAN packets and generates and sends LAN
42 packets or other messages to said one or more video servers and/or satellite
43 uplink/downlink circuitry requesting that the requested data be transmitted to said IP
44 wrapper circuit.

1 16. [original] The apparatus of claim 15 further comprising an IP dewrapper circuit
2 coupled to said packet switch via said local area network and functioning to receive LAN
3 packets encapsulating UDP/IP or TCP/IP packets encapsulating MPEG data and strip off
4 said LAN packet header and said UDP/IP packet header and output a pure MPEG transport
5 stream, and wherein said cherrypicker multiplexers address said UDP/IP or TCP/IP packets to
6 said IP dewrapper circuit and further function to encapsulate said UDP/IP or TCP/IP packets
7 into LAN packets addressed to said IP dewrapper circuit.

17. [currently amended] An apparatus comprising:

one or more video servers and/or satellite uplink/downlink circuitry that output MPEG transport streams encoding one or more video programs, each MPEG transport stream comprised of a plurality of MPEG packets each having a program identification code (hereafter PID);

one or more web servers coupled to the internet;

an IP wrapper circuit for receiving MPEG transport streams on one or more inputs coupled to said one or more video servers and/or satellite receivers, and mapping said PIDs ~~the program identification codes (hereafter PID)~~ and input number for each MPEG packet in each said transport stream into an IP packet header multicast destination address and encapsulating one or more of said MPEG packets having the same PID and input number into an IP packet and encapsulating each IP packet into a LAN packet having an LAN packet destination address which is a multicast address but which is unique to the PID and input number of the MPEG packets enclosed therein;

a local area network coupled to said IP wrapper circuit and said one or more web servers;

a packet switch coupled to said IP wrapper circuit and said one or more web servers via said local area network;

one or more cherrypicker multiplexers coupled to said packet switch via said local area network, each functioning to receive data defining which programs have been requested by one or more customers or which is to be transmitted regardless of requests for it and generating and transmitting to said packet switch one or more packets identifying by LAN packet destination address the LAN packets said packet switch is to route to said cherrypicker multiplexer, and for receiving from said packet switch the requested LAN packets encapsulating MPEG data and assembling MPEG transport streams that are to be sent to said customers containing data encoding the

28 programs which have been requested or which are to be transmitted regardless of
29 request, and encapsulating MPEG packets from said transport streams into UDP/IP
30 or TCP/IP packets addressed either to ~~a the~~ host computer and a process on said
31 host computer at a customer site to which ~~said the~~ data is to be sent or addressed to
32 an IP dewrapper circuit coupled by said local area network to said packet switch and
33 which does not form part of the invention of this claim;

34 means for receiving upstream requests for video-on-demand programs or
35 other TCP/IP packetized data from the internet or other sources and for transmitting
36 those requests to said cherrypicker multiplexers;

37 and wherein said cherrypicker multiplexers convert said upstream requests to
38 particular PIDs and input numbers or any format suitable for communicating to the
39 source of the requested data what data was requested, and generate and send to
40 said packet switch LAN packets or other messages identifying the particular TCP/IP
41 data encapsulated in LAN packets and/or LAN packets encapsulating video program
42 data to be routed to each said cherrypicker multiplexer, said LAN packets being
43 identified by LAN destination address, said LAN packet to be routed to said
44 cherrypicker multiplexers being ones which will carry the video programs and/or other
45 TCP/IP packetized data requested in said upstream requests;

46 and wherein said packet switch functions to receive said LAN packets or
47 messages identifying the requested LAN packets and generates and sends LAN
48 packets or other messages to said one or more video servers and/or satellite
49 uplink/downlink circuitry requesting that the requested video data be transmitted to
50 said IP wrapper circuit and that the requested TCP/IP data be transmitted to said
51 packet switch, said packet switch functioning to receive LAN packets encapsulating
52 the requested video and/or TCP/IP packetized data and route said LAN packets to
53 the cherrypicker multiplexer that requested said data.

1 18. [original] The apparatus of claim 17 further comprising an IP dewrapper circuit
2 coupled to said packet switch via said local area network and functioning to receive LAN
3 packets encapsulating UDP/IP or TCP/IP packets encapsulating MPEG data and strip off
4 said LAN packet header and said UDP/IP packet header and output a pure MPEG transport
5 stream, and wherein said cherry picker multiplexers address said UDP/IP or TCP/IP packets to
6 said IP dewrapper circuit and further function to encapsulate said UDP/IP or TCP/IP packets
7 into LAN packets addressed to said IP dewrapper circuit.

1 19. [currently amended] A process for supplying video data to consumers,
2 comprising the steps of:

3 (1) receiving one or more MPEG transport streams containing data encoding
4 video programs to be transmitted to one or more consumers, each MPEG transport
5 stream comprised of a plurality of MPEG packets each having a program identification
6 code (hereafter PID);;

7 (2) encapsulating one or more MPEG packets having the same PID ~~program~~
8 ~~identification code and input multiplex number (together hereafter referred to as a~~
9 ~~PID)~~ from said transport streams in the payload portion of an internet protocol packet
10 (hereafter referred to as an IP packet) and mapping the PID of the encapsulated
11 MPEG packets into an IP multicast address used as the destination address of said
12 IP packet;

13 (3) encapsulating each said IP packet in a local area network packet and
14 mapping said IP packet multicast destination address into a multicast destination
15 address for the local area network destination address which is unique for each PID;

16 (4) transmitting said local area network packets so generated over said local
17 area network to a packet switch;

18 (5) receiving in said packet switch from each of said one or more cherry picker
19 multiplexers one or more local area network packets containing data indicating the

video program data to be routed to said cherrypicker multiplexer and routing incoming local area network packets containing data specified by a cherrypicker multiplexer as desired data to said cherrypicker multiplexer;

(6) in each cherrypicker multiplexer, sorting incoming MPEG packets by their PIDs into one or more MPEG transport streams to be transmitted to one or more customers and packetizing each MPEG transport stream into TCP/IP or UDP/IP packets.

20. [currently amended] The process of claim 19 wherein step (5) includes at least receiving at said packet switch from each cherrypicker multiplexer one or more local area network packets containing data indicating ~~video~~ video-on-demand program data which has been requested by one or more customers being served by said cherrypicker multiplexer, and wherein step (6) further comprises packetizing MPEG packets from each MPEG transport stream encoding a video-on-demand program which has been requested by a customer in TCP/IP or UDP/IP packets addressed to a the host computer and a particular process executing on said that host computer which requested said video-on-demand program data.

21. [original] The process of claim 19 wherein step (5) includes at least receiving from each cherrypicker multiplexer one or more local area network packets containing data indicating video program data which has been requested by one or more customers being served by said cherrypicker multiplexer, and wherein step (6) further comprises packetizing MPEG packets from each MPEG transport stream encoding a video-on-demand program which has been requested by a customer in TCP/IP or UDP/IP packets addressed to an MPEG transport stream generating process in one of one or more IP dewrapper circuits which transmits MPEG transport streams to customers, the particular IP dewrapper circuit to which said TCP/IP or UDP/IP packets encoding a particular video-on-demand program are addressed being the one which transmits an MPEG transport stream to a customer which

11 requested said video-on-demand program, and further comprising the step of encapsulating
12 said TCP/IP or UDP/IP packets in a local area network packet addressed to said IP
13 dewrapper circuit.

1 22. [original] The process of claim 21 further comprising stripping off the local area
2 network packet headers and TCP/IP or UDP/IP packet headers from said local area network
3 packets encapsulating the MPEG packets which encode a particular video-on-demand
4 program and transmitting said MPEG packets to the customer which requested said video-on-
5 demand program as an MPEG transport stream which is modulated in any way and
6 multiplexed, if necessary, in any way onto any suitable downstream logical and physical
7 channel.

1 23. [currently amended] The process of claim 19 wherein step (6) further comprises
2 the steps of:
3 receiving data indicating the available bandwidth for MPEG packets encoding
4 particular video programs;
5 decompressing at least partially the MPEG packets received in each
6 cherrypicker multiplexer;
7 recompressing the video data from MPEG packets encoding each particular
8 video program to the available bandwidth specified for that particular video program;
9 and
10 repacketizing the video data into MPEG packets in an MPEG transport
11 stream.

1 24. [original] The process of claim 20 wherein step (6) further comprises the steps of:
2 receiving data indicating the available bandwidth for MPEG packet encoding
3 particular video programs;

4 decompressing at least partially the MPEG packets received in each
5 cherrypicker multiplexer;
6 recompressing the video data from MPEG packets encoding each particular
7 video program to the available bandwidth specified for that particular video program;
8 and
9 repacketizing the video data into MPEG packets in an MPEG transport
10 stream.

1 25. [original] The process of claim 21 wherein step (6) further comprises the steps of:
2 receiving data indicating the available bandwidth for MPEG packet encoding
3 particular video programs;
4 decompressing at least partially the MPEG packets received in each
5 cherrypicker multiplexer;
6 recompressing the video data from MPEG packets encoding each particular
7 video program to the available bandwidth specified for that particular video program;
8 and
9 repacketizing the video data into MPEG packets in an MPEG transport
10 stream.

1 26. [currently amended] The process of claim 22 ~~24~~ wherein step (6) further
2 comprises the steps of:
3 receiving data indicating the available bandwidth for MPEG packet encoding
4 particular video programs;
5 decompressing at least partially the MPEG packets received in each
6 cherrypicker multiplexer;
7 recompressing the video data from MPEG packets encoding each particular
8 video program to the available bandwidth specified for that particular video program;

9 and

10 repacketizing the video data into MPEG packets in an MPEG transport
11 stream.

1 27. [currently amended] A process for supplying video data to consumers,
2 comprising the steps of:

3 (1) receiving one or more MPEG transport streams containing data encoding
4 video programs to be transmitted to one or more consumers, each MPEG transport
5 stream comprised of a plurality of MPEG packets each having a program identification
6 code (hereafter PID);

7 (2) encapsulating one or more MPEG packets having the same PID ~~program~~
8 ~~identification code~~ and input multiplex number (together hereafter referred to as a
9 combined PID) from said transport streams in the payload portion of an internet
10 protocol packet (hereafter referred to as an IP packet) and mapping the combined
11 PID of the encapsulated MPEG packets into an IP multicast address used as the
12 destination address of said IP packet;

13 (3) encapsulating each said IP packet in a local area network packet and
14 mapping said IP packet multicast destination address into a multicast destination
15 address for the local area network destination address which is unique for each
16 combined PID;

17 (4) transmitting said local area network packets so generated over said local
18 area network to a packet switch;

19 (5) receiving in said packet switch from each of said one or more cherrypicker
20 multiplexers one or more local area network packets containing data indicating the
21 video-on-demand program data which has been requested by one or more customers
22 and which is to be routed to said cherrypicker multiplexer and routing incoming local
23 area network packets containing data specified by a cherrypicker multiplexer as

24 desired data to said cherrypicker multiplexer;

25 (6) in each cherrypicker multiplexer, sorting incoming MPEG packets by their
26 combined PIDs into one or more MPEG transport streams to be transmitted to one or
27 more customers and further comprising the steps of packetizing MPEG packets from
28 each MPEG transport stream encoding a video-on-demand program which has been
29 requested by a customer in TCP/IP or UDP/IP packets addressed to an MPEG
30 transport stream generating process in one of one or more IP dewrapper circuits
31 which transmit MPEG transport streams to customers, the particular IP dewrapper
32 circuit to which said TCP/IP or UDP/IP packets encoding a particular video-on-
33 demand program are addressed being the one which transmits an MPEG transport
34 stream to a customer which requested said video-on-demand program, and further
35 comprising the step of encapsulating said TCP/IP or UDP/IP packets in a local area
36 network packet addressed to said IP dewrapper circuit;

37 (7) stripping off the local area network packet headers and TCP/IP or UDP/IP
38 packet headers from said local area network packets encapsulating the MPEG
39 packets which encode a particular video-on-demand program and transmitting said
40 MPEG packets to the customer which requested said video-on-demand program as
41 an MPEG transport stream which is modulated in any way and multiplexed, if
42 necessary, in any way onto any suitable downstream logical and physical channel;

43 (8) and wherein step (6) further comprises the steps of:

44 receiving data indicating the available bandwidth for MPEG packet
45 encoding particular video programs;

46 decompressing at least partially the MPEG packets received in each
47 cherrypicker multiplexer;

48 recompressing the video data from MPEG packets encoding each
49 particular video program to the available bandwidth specified for that
50 particular video program; and

51 repacketizing the video data into MPEG packets in an MPEG
52 transport stream.

1 28. [currently amended] ~~(First Embodiment)~~ A process carried out at a headend
2 having video servers coupled thereto for supplying video data from video servers coupled to
3 said headend and iData and video data to consumers, wherein iData is defined as data from
4 one or more web or other servers coupled to said headend other than said video servers
5 coupled to said headend, comprising the steps of:

6 (1) in a modem coupled to one or more customers by any upstream and
7 downstream data paths, receiving upstream video-on-demand requests and requests
8 for iData and iData command packets, packetizing said requests and commands into
9 local area network packets (hereafter LAN packets) and transmitting LAN packets
10 containing requests for iData and other commands via a local area network to an
11 appropriate server entity which can supply the requested iData or execute the iData
12 command, and transmitting LAN packets containing video-on-demand requests to
13 one or more cherrypicker multiplexers;

14 (2) simultaneously or at different times, receiving in an IP dewrapper circuit
15 one or more MPEG transport streams containing data encoding video programs to be
16 transmitted to one or more consumers, each MPEG transport stream comprised of a
17 plurality of MPEG packets each having a program identification code (hereafter PID);;

18 (3) receiving or generating in a web server connected to the internet or any
19 other type of server including an application server one or more TCP/IP or UDP/IP
20 packets of iData and encapsulating them in local area network packets addressed to
21 a modem which will be used to transmit the TCP/IP or UDP/IP packets encapsulated
22 in said LAN packets downstream and transmitting said LAN packets to a packet
23 switch;

24 (4) in said packet switch, routing said LAN packets containing iData to said

25 modem;

26 (5) in said modem, receiving said LAN packets containing iData and
27 transmitting them downstream to the customer which requested said iData;

28 (6) in an IP wrapper circuit, encapsulating one or more MPEG packets of
29 video program data having the same PID ~~program identification code~~ and input
30 multiplex number (together hereafter referred to as a combined PID) from said
31 transport streams in the payload portion of an internet protocol packet (hereafter
32 referred to as an IP packet) and mapping ~~the~~ said combined PID of the encapsulated
33 MPEG packets into an IP multicast address used as the destination address of said
34 IP packet;

35 (7) in said IP wrapper circuit encapsulating each said IP packet in a LAN
36 packet and mapping said IP packet multicast destination address into a multicast
37 destination address for the local area network destination address which is unique for
38 each said combined PID;

39 (8) transmitting said LAN packets so generated containing video program
40 data over said local area network to a packet switch;

41 (9) receiving in said packet switch from each of said one or more cherrypicker
42 multiplexers one or more LAN packets containing data indicating the video program
43 data to be routed to said cherrypicker multiplexer and routing incoming LAN packets
44 containing data specified by a cherrypicker multiplexer as desired data to said
45 cherrypicker multiplexer;

46 (10) in each cherrypicker multiplexer, receiving data indicating video-on-
47 demand requests for video programs and transmitting data to said packet switch
48 indicating which LAN packets containing video program data to route to said
49 cherrypicker multiplexer, and sorting incoming MPEG packets by their combined PIDs
50 into one or more MPEG transport streams to be transmitted to one or more customers
51 and performing the following steps:

52 decompressing at least partially the MPEG packets received in each
53 cherrypicker multiplexer;
54 recompressing the video data from MPEG packets encoding each
55 particular video program to the available bandwidth specified for that
56 particular video program; and
57 repacketizing the video data into MPEG packets and packetizing said
58 MPEG packets in TCP/IP or UDP/IP packets.

1 29. [currently amended] The process of claim 28 wherein said TCP/IP or UDP/IP
2 packets generated by said cherrypicker multiplexer are addressed to ~~the~~ a host computer
3 and process executing on said host computer at a customer location to which the data
4 encapsulated in said TCP/IP or UDP/IP packets is to be sent, and further comprising the step
5 of transmitting said TCP/IP or UDP/IP packets to said host computer and process executing
6 on said host over any downstream logical channel which has TCP/IP or UDP/IP connectivity
7 all the way to said host computer and process running on said host computer.

1 30. [currently amended] The process of claim 28 wherein said TCP/IP or UDP/IP
2 packets generated by said cherrypicker multiplexer are addressed to an IP dewrapper circuit,
3 and further comprising the steps of:
4 encapsulating said TCP/IP or UDP/IP packets in local area network packets
5 addressed to said IP dewrapper circuit;
6 in said IP dewrapper circuit, receiving said LAN packets and stripping off the
7 LAN packet headers and TCP/IP or UDP/IP packet headers and assembling the
8 encapsulated MPEG packets into MPEG transport streams;
9 transmitting said MPEG transport streams to specific customers over logical
10 channels on any suitable downstream medium; and
11 if said MPEG video data contains video-on-demand video program data for

12 which ~~the~~ a host computer and a process executing on said host computer at the
13 customer location which requested the video program does not have data regarding
14 which logical channel said requested video program data will be transmitted on
15 and/or what PID the video program data will have, transmitting a downstream
16 message to said host computer and said process executing on said host computer
17 which requested said video program data indicating which logical channel said video
18 program will be transmitted on and, if necessary, what PID or PIDs said requested
19 video program data will have.

1 31. [currently amended] ~~(Second Embodiment)~~ A process carried out at a headend having
2 video servers coupled thereto, said process for supplying video data to consumers,
3 comprising the steps of:

4 (1) in a modem coupled to one or more customers by any upstream and
5 downstream data paths, receiving upstream video-on-demand requests and requests
6 for iData, wherein iData is defined as data from one or more web or other servers
7 coupled to said headend other than said video servers coupled to said headend,
8 packetizing said requests into local area network packets (hereafter LAN packets)
9 and transmitting LAN packets containing each request for iData via a local area
10 network to an appropriate server entity which can supply the requested iData along
11 with message data indicating to which of one or more cherrypicker multiplexers to
12 transmit the requested iData, and transmitting LAN packets containing video-on-
13 demand requests to one or more cherrypicker multiplexers;

14 (2) receiving in an IP dewrapper circuit one or more MPEG transport streams
15 containing data encoding video programs to be transmitted to one or more
16 consumers, each MPEG transport stream comprised of a plurality of MPEG packets
17 each having a program identification code (hereafter PID);

18 (3) receiving or generating in a web server connected to the internet or any

19 other type of server including an application server one or more TCP/IP or UDP/IP
20 packets of iData and encapsulating them in ~~local area~~ network packets (hereafter
21 network LAN packets) addressed to one or more cherrypicker multiplexers at least
22 one of which will be used to transmit said iData packets downstream in an ~~and~~ MPEG
23 transport stream, and transmitting said network LAN packets to a packet switch;

24 (4) in said packet switch, routing said network LAN packets containing iData
25 to a cherrypicker multiplexer;

26 (5) in each said cherrypicker multiplexer, receiving said network LAN packets
27 containing iData and recovering iData stored therein ~~stripping off said LAN packets~~
28 ~~header and said TCP/IP or UDP/IP packet header and encapsulating the enclosed~~
29 ~~iData in a TCP/IP or UDP/IP packet;~~

30 (6) in an IP wrapper circuit, encapsulating one or more MPEG packets of
31 video program data having the same PID ~~program identification code~~ and input
32 multiplex number (together hereafter referred to as a combined PID) from said
33 transport streams in the payload portion of an internet protocol packet (hereafter
34 referred to as an IP packet) and mapping the combined PID of the encapsulated
35 MPEG packets into an IP multicast address used as a ~~the~~ destination address of said
36 IP packet;

37 (7) in said IP wrapper circuit, encapsulating each said IP packet in a LAN
38 packet and mapping said IP packet multicast destination address into a ~~multicast~~
39 ~~destination address for the local area network destination address which is unique for~~
40 each said combined PID and placing said local area network destination address in
41 said LAN packet;

42 (8) transmitting said LAN packets so generated containing video program
43 data over said local area network to a packet switch;

44 (9) receiving in said packet switch from each of said one or more cherrypicker
45 multiplexers one or more LAN packets containing data indicating which LAN packets

46 containing said ~~the~~ video program data or iData are to be routed to said cherrypicker
 47 multiplexer and routing incoming LAN packets containing the specified data specified
 48 ~~by a cherrypicker multiplexer as desired data~~ to said cherrypicker multiplexer;

49 (10) in each cherrypicker multiplexer, receiving VOD request data indicating
 50 video-on-demand requests for video programs made by customers and transmitting
 51 LAN packets containing said VOD request data to said packet switch indicating which
 52 LAN packets containing video-on-demand program data to route to said cherrypicker
 53 multiplexer, and sorting incoming LAN packets arriving from said packet switch and
 54 containing MPEG packets containing video data by a PID in each MPEG packet or
 55 by local area network station addresses in said incoming LAN packets, each of said
 56 local area network station addresses being mapped to a PID in an MPEG packet
 57 encapsulated in said LAN packet, said sorting resulting in one or more pluralities of
 58 LAN packets containing MPEG packet data from which ~~their PIDs into~~ one or more
 59 MPEG transport streams to be transmitted to one or more customers can be created,
 60 and performing the following steps:

61 recovering MPEG packets encapsulated in said LAN packets and
 62 decompressing at least partially the MPEG packets received in each
 63 cherrypicker multiplexer;

64 recompressing the data from MPEG packets encoding each particular
 65 video program and iData to the available bandwidth specified for that
 66 particular video program or iData; and

67 repacketizing the video data and iData into MPEG packets and
 68 packetizing said MPEG packets in TCP/IP or UDP/IP packets.

1 32. [currently amended] The process of claim 31 wherein said TCP/IP or UDP/IP
 2 packets generated by each said cherrypicker multiplexer are addressed to ~~the~~ a host
 3 computer and process executing on said host computer at a customer location to which the

4 video data or iData encapsulated in said TCP/IP or UDP/IP packets is to be sent, and further
5 comprising the step of transmitting said TCP/IP or UDP/IP packets to said host computer and
6 process running on said host computer over any downstream logical channel which has
7 TCP/IP or UDP/IP connectivity all the way to said host computer and process running on said
8 host computer.

1 33. [currently amended] The process of claim 31 wherein said TCP/IP or UDP/IP
2 packets generated by said cherry picker multiplexer are addressed to an IP dewrapper circuit,
3 and further comprising the steps of:

4 encapsulating said TCP/IP or UDP/IP packets in LAN packets addressed to
5 said IP dewrapper circuit;

6 in said IP dewrapper circuit, receiving said LAN packets and stripping off the
7 LAN packet headers and TCP/IP or UDP/IP packet headers and assembling the
8 encapsulated MPEG packets into MPEG transport streams;

9 transmitting said MPEG transport streams to specific customers over logical
10 channels on any suitable downstream medium; and

11 if said MPEG video data contains video-on-demand video program data for
12 which the host and process at the customer location which requested the video
13 program does not have data regarding which logical channel said requested video
14 program data will be transmitted on and/or what PID the video program data will
15 have, transmitting a downstream message to ~~said a~~ a host computer and a process
16 running on said host computer which requested said video program data indicating
17 which logical channel said video program will be transmitted on and, if necessary,
18 what PID or PIDs said requested video program data will have.

1 34. [currently amended] (~~Third embodiment~~) A process carried out at a headend having
2 video servers coupled thereto, said process for supplying video data to consumers,

3 comprising the steps for:

4 (1) in a modem coupled to one or more customers by any upstream, receiving
5 upstream video-on-demand requests and requests for iData and iData commandss,
6 wherein iData is defined as data from one or more web or other servers other than
7 said video servers coupled to said headend, and transmitting them to a control
8 computer;

9 (2) in said control computer transmitting one or more messages to one or
10 more video servers, web servers and/or application servers that can supply the
11 requested data requesting that they supply the requested data and assigning logical
12 channels on which the requested iData and video program data is to be transmitted
13 to the customer and generating downstream messages to be sent to each customer
14 telling the customer which logical channel upon which the data said customer
15 requested will be found;

16 (3) transmitting the requested iData and video program data and downstream
17 message data to one or more cherrypicker multiplexers; and

18 (4) in each cherrypicker multiplexer, adjusting the bandwidth of the video data
19 and/or the iData if necessary and repacketizing said video data and iData and
20 downstream message data in MPEG packets and transmitting said MPEG packets to
21 the customer who requested the data via an MPEG transport stream.

35. [currently amended] A process carried out in a headend coupled to one or more
video servers, said process for supplying video data and iData to consumerss, wherein iData
is defined as data from one or more web or other servers other than said video servers
coupled to said headend, comprising the steps of ~~for~~:

(1) in a modem coupled to one or more customers by any upstream data path
and any downstream data path compatible with said modem, receiving upstream
video-on-demand requests and requests for iData and iData commands and

transmitting them to a control computer, and receiving downstream iData and downstream command and control messages, both said downstream iData and said command and control messages encapsulated in TCP/IP or UDP/IP packets addressed to a host computer and one or more processes running on said host computer at a customer location, and transmitting said downstream iData and command and control messages to said customer to which it is addressed over said downstream data path;

(2) in said control computer transmitting one or more messages to one or more video servers, web servers and/or application servers that can supply the requested video data and iData requesting that they supply the requested video data and iData and assigning logical channels on which the requested video program data is to be transmitted to the customer and generating downstream command and control messages to be sent to each customer telling the customer which logical channel upon which the video-on-demand data said customer requested will be found;

(3) transmitting the requested video program data to one or more cherrypicker multiplexers; and

(4) in each cherrypicker multiplexer, adjusting the bandwidth of the video data of each video program if necessary to a smaller bandwidth and repacketizing said video data in MPEG packets and transmitting said MPEG packets to the customer who requested the data via an MPEG transport stream.

36. [currently amended] The process of claim 35 wherein said modem is a Data Over Cable Service Interface Specifications (hereafter DOCSIS) compliant DOCSIS cable modem and said upstream and downstream data paths are hybrid fiber coaxial cable plants.

1 37. [currently amended] The process of claim 35 wherein said modem is one or

2 more digital subscriber line modems, and said upstream and downstream data paths are
3 digital subscriber lines.

1 38. [currently amended] The process of claim 35 wherein said modem is comprised
2 of a conventional telephone line modem receiver for receiving upstream data and commands
3 from a customer and a downstream circuit for delivery of data and commands downstream to
4 a customer using a satellite transmitting to a satellite antenna and satellite receiver at a
5 customer premises where said satellite antenna and satellite receiver at the customer
6 premises are not part of the invention, said downstream circuit of said modem comprising a
7 satellite uplink transmitter and a satellite transponder for transmitting said downstream data to
8 a satellite for transmission downstream to said customer via said satellite transponder, and
9 wherein said upstream data path is a conventional POTS telephone line, ~~and said~~
10 ~~downstream data path is a satellite uplink, a satellite transponder and a satellite downlink~~
11 ~~and satellite receiver at the customer site.~~

1 39. [currently amended] A process carried out in a headend coupled to one or more
2 video servers, said process for supplying video data to consumers, comprising the steps of
3 for:

4 (1) in a modem coupled to one or more customers by any upstream and any
5 downstream data path, receiving upstream video-on-demand requests and requests
6 for iData and iData commands and transmitting them to a control computer, wherein
7 iData is defined as data from one or more web or other servers other than said video
8 servers coupled to said headend, and receiving downstream command and control
9 messages from said control computer and transmitting them to customers over said
10 downstream data path via said modem;

11 (2) in said control computer transmitting one or more messages to one or
12 more video servers, web servers and/or application servers that can supply the

requested data requesting that they supply the requested video data and iData and assigning logical channels on which the requested iData and video program data is to be transmitted to the customer and generating downstream command and control messages to be sent to each customer telling the customer which logical channel upon which the iData and video program data said customer requested will be found;

(3) transmitting the requested iData and video program data to one or more cherrypicker multiplexers; and

(4) in each cherrypicker multiplexer, adjusting the bandwidth of the video data and/or the iData, if necessary, to a smaller bandwidth, and repacketizing said video data and iData in MPEG packets and transmitting said MPEG packets to the one or more customer who requested the data via one or more logical channels as one or more MPEG transport streams.

40. [currently amended] The process of claim 39 wherein said modem is a Data Over Cable Service Interface Specifications (hereafter DOCSIS) compliant DOCSIS cable modem and said upstream and downstream data paths are hybrid fiber coaxial cable plants.

41. [currently amended] The process of claim 39 wherein said modem is one or more digital subscriber line modems, and said upstream and downstream data paths are digital subscriber lines.

42. [currently amended] The process of claim 39 wherein said modem is comprised of a conventional telephone line modem receiver for receiving upstream data and commands from a customer and a downstream circuit for delivery of data and commands downstream to a customer using a satellite transmitting to a satellite antenna and satellite receiver at a customer premises where said satellite antenna and satellite receiver at the customer premises are not part of the invention, said downstream circuit of said modem comprising a

7 satellite uplink transmitter and a satellite transponder for transmitting said downstream data to
8 a satellite for transmission downstream to said customer via said satellite transponder, and
9 wherein said upstream data path is a conventional POTS telephone line, ~~and said~~
10 ~~downstream data path is a satellite uplink, a satellite transponder and a satellite downlink~~
11 ~~and satellite receiver at the customer site.~~